

**NATIONAL TRANSPORTATION SAFETY BOARD
Office of Research and Engineering
Vehicle Recorder Division
Washington, D.C. 20594**



GROUP CHAIRMAN'S FACTUAL REPORT OF INVESTIGATION

WPR21FA286

**By
Michael Portman**

Warning

The reader of this report is cautioned that the transcript of a cockpit voice recorder audio recording is not a precise science but is the best product possible from an NTSB group investigative effort. The transcript or parts thereof, if taken out of context, could be misleading. The transcript should be viewed as an accident investigation tool to be used in conjunction with other evidence gathered during the investigation. Conclusions or interpretations should not be made using the transcript as the sole source of information.

NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorder Division

June 16, 2022

Cockpit Voice Recorder

Group Chairman's Factual Report
By Michael Portman

1. EVENT SUMMARY

Location: Truckee, California
Date: July 26, 2021
Aircraft: Bombardier CL-600-2B16, Registration N605TR
Operator: Aeolus Air Charter
NTSB Number: WPR21FA286

A solid-state cockpit voice recorder (CVR) was sent to the National Transportation Safety Board (NTSB) Vehicle Recorder Division for evaluation. The CVR group meeting convened on August 24, 2021, and a summary and partial transcript was prepared for the approximately 2-hour, 4-minute, 15-second digital recording (see attached).

2. GROUP

Chairman:	Michael Portman Aerospace Engineer – Recorder Specialist National Transportation Safety Board
Member:	Todd Gentry Air Safety Investigator Federal Aviation Administration
Member:	Étienne Côté Demonstration Pilot, Air Safety Investigator Bombardier

3. DETAILS OF INVESTIGATION

The NTSB Vehicle Recorder Division received the following CVR:

Recorder Manufacturer/Model:	L-3/Fairchild FA2100-1020
Recorder Serial Number:	Unknown

3.1 CVR Carriage Requirements

Per federal regulation, multiengine turbine aircraft with more than six passenger seats and requiring two pilots manufactured prior to April 7, 2010, and operated under Title 14 *Code of Federal Regulations* Part 91, must be equipped with a CVR that records a minimum of the last 30 minutes of aircraft operation; this is accomplished by recording

over the oldest audio data. The accident aircraft was manufactured in 2007. When the L-3/Fairchild FA2100-1020 is deactivated or removed from the airplane, it retains the most recent 2 hours of CVR operation.

3.2 Recorder Description

This model CVR, the L-3/Fairchild FA2100-1020, records a minimum of 120 minutes of digital audio stored on solid state memory modules. Four channels are recorded: one channel for each flight crew, one channel for a cockpit observer, and one channel for the cockpit area microphone (CAM).

3.3 Recorder Damage

Upon arrival at the laboratory, it was evident that the exterior of the CVR had sustained heat and structural damage. The outer case was removed, and the interior crash-protected case did not appear to have significant heat or structural damage (see Figures 1 and 2). The memory board within the crash-protected case was checked for heat or structural damage and none was readily apparent. The heat-damaged ribbon cable (Figure 2) was removed and replaced with a new cable. The digital audio was successfully downloaded from the crash-survivable memory unit.

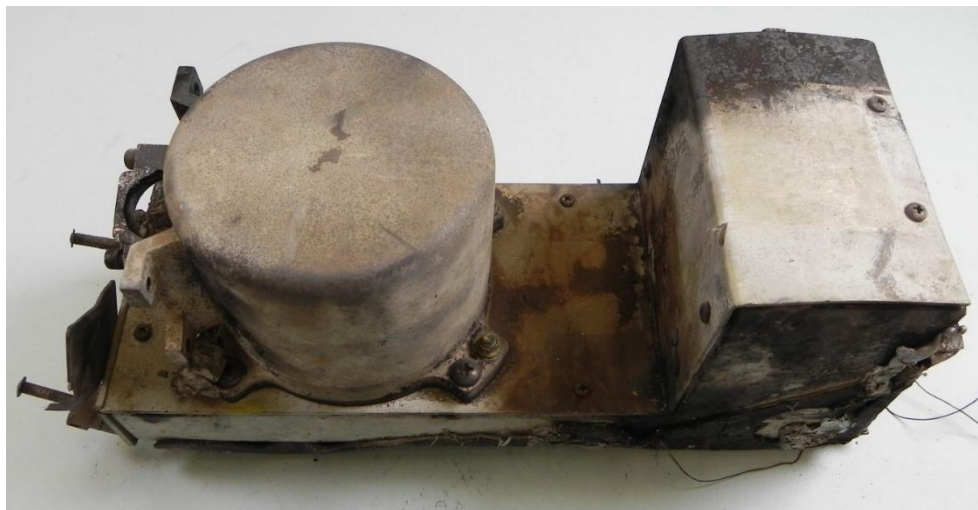


Figure 1. Exterior of the Cockpit Voice Recorder.

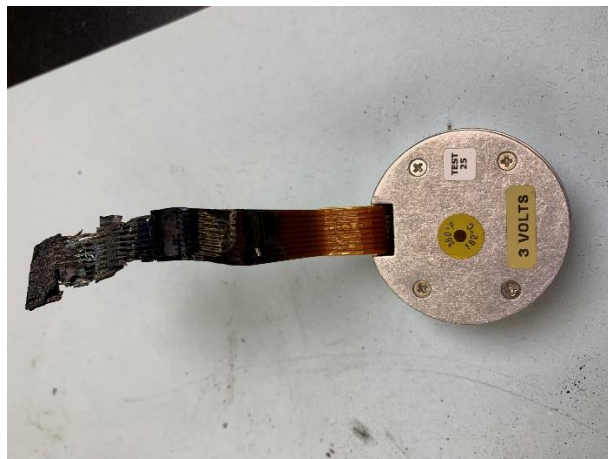


Figure 2. Memory module.

3.4 Audio Recording Description

Each channel's audio quality is indicated in Table 1.¹

Table 1. Audio Quality.

Channel Number	Content/Source	Quality	Duration (HH:MM:SS)
1	Captain	Excellent	02:04:15
2	First Officer	Excellent	02:04:15
3	Observer	Excellent	02:04:15
4	CAM	Good	02:04:15

3.5 Timing and Correlation

Timing on the transcript was established by correlating the CVR events to common events on the flight data recorder (FDR). Specifically, the last five radio transmissions that the aircraft made were correlated to the radio transmit microphone key parameter from the FDR. Each of the five radio transmissions acted as an anchor point for a linear interpolation between the remaining CVR events. Once a correlation between the two recorders was established, a reference to local time was determined. The CVR and FDR times were offset to reflect the local Pacific daylight time (PDT) of the accident. Therefore, for the rest of this report, all times are referenced in PDT.

3.6 Description of Audio Events

In agreement with the Investigator-In-Charge, a CVR group convened to transcribe the last approximately 58 minutes of the recording. A summary of the preceding events was produced by the recorder specialist. The recording began at 11:13:57 when the captain was pre-flighting the aircraft. The passengers boarded the aircraft at 11:30:26 and the boarding door was closed shortly thereafter. The engines were started at 11:33:57 and the aircraft began its takeoff roll at 11:45:11. The climb and cruise portions of the flight were generally uneventful. The transcript began at 12:20:28 with the crew discussing the arrival into Truckee. The flight was cleared direct to Truckee at 12:38:02, began its initial descent at 12:48:16, and was cleared for the RNAV runway 20 approach at 13:11:42, after a brief hold. The first officer checked in with Truckee tower at 13:14:34, and the flight was cleared to land at 13:16:30. The recording ended shortly thereafter at 13:18:12.

¹ See attached CVR Quality Rating Scale.

Attachment I

CVR Quality Rating Scale

The levels of recording quality are characterized by the following traits of the cockpit voice recorder information:

Excellent Quality	Virtually all of the crew conversations could be accurately and easily understood. The transcript that was developed may indicate only one or two words that were not intelligible. Any loss in the transcript is usually attributed to simultaneous cockpit/radio transmissions that obscure each other.
Good Quality	Most of the crew conversations could be accurately and easily understood. The transcript that was developed may indicate several words or phrases that were not intelligible. Any loss in the transcript can be attributed to minor technical deficiencies or momentary dropouts in the recording system or to a large number of simultaneous cockpit/radio transmissions that obscure each other.
Fair Quality	The majority of the crew conversations were intelligible. The transcript that was developed may indicate passages where conversations were unintelligible or fragmented. This type of recording is usually caused by cockpit noise that obscures portions of the voice signals or by a minor electrical or mechanical failure of the CVR system that distorts or obscures the audio information.
Poor Quality	Extraordinary means had to be used to make some of the crew conversations intelligible. The transcript that was developed may indicate fragmented phrases and conversations and may indicate extensive passages where conversations were missing or unintelligible. This type of recording is usually caused by a combination of a high cockpit noise level with a low voice signal (poor signal-to-noise ratio) or by a mechanical or electrical failure of the CVR system that severely distorts or obscures the audio information.
Unusable	Crew conversations may be discerned, but neither ordinary nor extraordinary means made it possible to develop a meaningful transcript of the conversations. This type of recording is usually caused by an almost total mechanical or electrical failure of the CVR system.

Transcript of a L-3/Fairchild FA2100-1020 solid-state cockpit voice recorder, serial number unknown, installed on an Aeolus Air Charter Bombardier CL-600-2B16 (N605TR), which crashed while circling to land at Truckee Tahoe Airport in Truckee, California.

LEGEND

AWOS	Radio transmission from the Truckee Tahoe Airport Automated Weather Observing System
CAM	Cockpit area microphone voice or sound source
HOT	Flight crew audio panel voice or sound source
RDO	Radio transmissions from N605TR
TWR	Radio transmission from the Truckee airport tower controller
ZLC	Radio transmission from Salt Lake center controller
ZOA	Radio transmission from Oakland center controller
-1	Voice identified as the captain
-2	Voice identified as the first officer
-A	Voice identified as the first center controller
-B	Voice identified as the second center controller
-C	Voice identified as the third center controller
-D	Voice identified as the fourth center controller
-E	Voice identified as the fifth center controller
-F	Voice identified as the sixth center controller
-?	Voice unidentified
*	Unintelligible word
#	Expletive
@	Non-pertinent word
()	Questionable insertion
[]	Editorial insertion

Note 1: Times are expressed in Pacific daylight time (PDT).

Note 2: Generally, only radio transmissions to and from the accident aircraft were transcribed.

Note 3: Words shown with excess vowels, letters, or drawn out syllables are a phonetic representation of the words as spoken.

Note 4: A non-pertinent word, where noted, refers to a word not directly related to the operation, control or condition of the aircraft.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
11:13:57.6	START OF RECORDING START OF SUMMARY		
11:28:49.6	[the first conversation between the captain and the first officer was noted]		
11:30:26.6	[the passengers arrived and boarded the aircraft]		
11:31:45.5	[sounds similar to the main door being closed were noted]		
11:32:52.8	[the captain asked the first officer if he left the fuel pumps on, the first officer responded, "no"]		
11:33:18.1	[the first officer asked if he should run start checks, the captain responded asking the first officer to hold on while he transferred fuel. The first officer responded that they can transfer fuel on the taxi, and the captain agreed]		
11:33:34.7	[the first officer ran the start checklist including: • passenger doors closed • fuel quantity and balance sufficient within limits • beacon on • boost pumps on • bleed air check • ignition on alpha • clear to start]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
11:33:57.8	[the first engine was started]		
11:34:52.8	[the second engine was started]		
11:35:29.7	[the captain called for the after-start checklist]		
11:35:51.7	[the crew performed the after-start checklist including: • generator 1&2 on • AC and DC electric pages check • APU gen on • APU on • ignition disarmed • packs on • 14th stage valve check complete • wing anti-ice check complete • wing anti-ice/isolation valve check complete • anti-ice cowl check complete • supplemental ground wing anti-ice not present • wing and cowl anti ice off, not required • ATS check • flight controls check • ground spoilers check • flight spoilers check • nose wheel steering checked • APR check • ADG auto deploy control unit the checklist completed with the crew confirming they were ready to taxi]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
11:37:20.9	[the captain engaged in non-pertinent discussion with a passenger]		
11:38:05.6	[the first officer inquired as to which runway they were taxiing to; the captain responded runway 24]		
11:38:11.6	[the first officer announced on the Coeur d'Alene airport common traffic advisory frequency (CTAF) that they were taxiing to runway 24]		
11:38:28.5	[there was a response on CTAF to call ground and hold short of taxiway November. The first officer expressed surprise that there was air traffic control at Coeur d'Alene airport] ²		
11:38:51.5	[the first officer called ground to receive a taxi clearance]		
11:40:16.2	[the first officer selected flaps 20 and asked if he should run the taxi checklist]		

² Coeur d'Alene airport is typically uncontrolled; however a temporary control tower had been established to coordinate nearby aerial firefighting operations. The operation of the temporary control tower was documented in a NOTAM, which was effective at the time of departure.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
11:40:19.9	[the first officer ran the taxi checklist including • transponder on VFR • brakes check • flaps 20 degrees indicated • thrust reversers check • aileron and rudder trims neutral • stabilizer trim 4.4, 4.5 required • flight instruments no flags, initial altitude 16,500 the checklist was interrupted at this point by the following radio transmission]		
11:40:59.2	[ground optioned a delay for release in order for the crew to pick up their flight plan on the ground. The first officer declined, opting to take off under visual flight rules (VFR) and pick up the clearance enroute]		
11:41:21.9	[the crew continued the taxi checklist including: • fuel balance sufficient withing limits • wing and cowl anti ice off not required]		
11:43:03.1	[the first officer informed ground they will be ready to go at the end of the taxiway and ground handed them over to tower]		
11:43:48.9	[the first officer contacted tower and was instructed to hold short for traffic]		
11:44:08.4	[the flight was cleared for takeoff]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
11:44:21.2	[the crew performed the takeoff checklist including: • correct runway confirmed • ignition on • wing and cowl anti-ice off, not required • windshield heat and probes on • cabin advised • cockpit lighting set • external lights set • CAS checked with a “right window” notification which was disregarded • take-off data sent • supplemental ground wing anti-ice not required • weather radar on • transponder/TCAS set • altimeters cross-checked]		
11:45:11.5	[the crew initiated the takeoff roll]		
11:45:27.0	[the first officer called 80 knots cross checked]		
11:45:32.0	[the first officer called V1]		
11:45:34.7	[the first officer called rotate]		
11:45:40.6	[the first officer called positive rate and the captain called for gear up, which the first officer confirmed]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
11:45:59.2	[the captain called that they were passing through 1,000 feet, called for flaps up, heading mode, and flight level change mode]		
11:46:14.5	[the first officer asked if he should run the after-takeoff checks and the captain agreed]		
11:46:17.7	[the crew ran the after-takeoff checklist including: • landing gear up • flaps up • thrust reversers off • CAS checked and clear • ignition off not required • wing and cowl anti-ice off • after takeoff complete]		
11:46:25.2	[during the checklist, the captain asked for the autopilot to be engaged]		
11:46:35.9	[the flight was handed to Spokane departure for their instrument flight rules (IFR) clearance, and the crew contacted Spokane departure shortly thereafter]		
11:47:40.4	[the crew were instructed to remain at or below 12,000 feet]		
11:48:22.1	[the crew were instructed to climb and maintain Flight Level 230 (FL230)]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
11:48:29.3	[the flight was handed to Seattle center]		
11:49:00.3	[without audible prompting from the captain, the first officer ran the climb checks including: • pressurization checked • packs transferring • climb thrust set • APU gen/APU down • TAWS on • passenger signs off • external lights configured • standing by for transition altitude]		
11:50:26.2	[the first officer asked which runway they predict using; the captain predicted runway 11]		
11:50:57.2	[the first officer obtained a weather report for Truckee including winds variable at 3 knots, visibility 6 statute miles with haze, skies broken at 5,000 feet and broken at 12,000 feet]		
11:51:57.3	[the flight was handed to the next Seattle center controller]		
11:52:11.6	[the crew received an altitude alert]		
11:52:22.6	[the flight crew checked in to the next Seattle center controller leveling at FL230 and were cleared to FL360]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
11:54:29.4	[the first officer called "standard left right and center," indicating the aircraft had transitioned to standard pressure. No acknowledgement from the captain was noted in the recording.]		
11:55:20.4	[the flight was cleared direct to the REO VOR and cleared to FL370]		
11:57:12.6	[the captain engaged in a discussion with a passenger about indoctrination videos the captain was making for the company and was therefore too busy to see the Coeur d'Alene area]		
11:59:19.0	[the crew engaged in a discussion regarding the difference in engine power between this aircraft and Challenger 601s]		
11:59:56.2	[the crew engaged in a discussion about turning on, setting up, and using the Stratus]		
12:02:03.1	[the crew simultaneously received an altitude alert and an ATC traffic notification cautioning wake turbulence]		
12:02:46.8	[the crew engaged in a discussion about the traffic monitoring system]		
12:07:48.5	[the flight crew engaged in a discussion about ForeFlight weather]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
12:09:01.5	[the flight was handed over to Salt Lake center]		
12:11:07.0	[the crew engaged in a discussion about the next flight]		
12:13:44.4	[the first officer took control of the aircraft so the captain could leave the flight deck to check on the passengers. There was no clear indication when the captain returned to the flight deck]		
12:15:42.9	[the crew engaged in a discussion about fuel requirements on the next flight]		
12:20:28.2	START OF TRANSCRIPT		
12:20:28.2	HOT-1 so...uhh...we can program the G-P-S for runway one one 'cause the wind is calm right now so we're coming from MUSTANG to ALANT then LEKYI then FAMPU...final fix.		
12:20:46.5	HOT-2 so you do want to do the approach or do you want to stay visual?		
12:20:51.1	HOT-1 visibility is not so good right now...so I prefer to do it.		
12:20:54.9	HOT-2 it's not so good right now? okay.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
12:20:55.7 HOT-1	no.		
12:20:58.1 HOT-2	piece of cake.		
12:20:59.5 HOT-2	continue with your briefing I'm sorry...I thought it was...I thought it was beautiful.		
12:21:04.9 HOT-1	no...uh...look.		
12:21:12.1 HOT-1	zero four statute miles...***...six hundred...marginal V-F-R. [overlapping radio communications]		
12:21:23.7 HOT-2	perfect...okay perfect.		
12:21:28.6 HOT-1	so if you are agree...uhhhh...[muttering]...we're gonna do the R-NAV...we have two NOTAMS...uhh the runway end I-D light...*** [overlapping radio communications]...and taxiway alpha bravo...***...taxiway F closed...so the eh...observation will be eighteen zero Oakland Center thirty seven nine...Truckee Tower one twenty fifty seven ground point eight final approach course will be one twenty six R-NAV for runway eleven Truckee.		
12:22:18.9 HOT-1	did you...did you already program that?		
12:22:20.6 HOT-2	I have...no I have not programmed nothing.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
12:22:32.6 HOT-1	so if you are agree I just put uh from uh MUSTANG to ALANT then uh...on this leg...there is no...we are not gonna make a procedure turn...to LEKYI...ALANT...LEKYI then FAMPU...and uhhh...FAMPU is...I'm gonna take the above...here...and put in LEKYI...		
12:23:07.4 HOT-1	...'kay? then on the way...so it's gonna be L-NAV M-D-A *...so I'm gonna rise fifty feet...so we agree...the reference...speeds...will be...seven thousand seven hundred...seven...*.		
12:23:42.0 HOT-1	we agree?		
12:23:43.2 HOT-2	okay.		
12:23:45.2 HOT-1	uhhh...we're gonna make a L-NAV with...so just to remember...*...L-NAV and NAV...V-NAV...'kay?		
12:24:03.5 HOT-1	L-NAV with V-NAV and in case of (go/fly) around...climbing left turn twelve thousand feet...direct to KEBTE and track two oh two to LEKYI...it's gonna be teardrop entry...hold...and continue holding twelve thousand and do not exceed two twenty...one and uhh **...twelve thousand feet the M-S-A...all right...and uhhh...once we land there...Truckee...if I have time...I dunno...uhh foxtrot is closed...so uhh...we're gonna land-I'm gonna land and I'm gonna...taxi out via golf...runway ***...and the truck is here...'kay...anything wh-that you want to?		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
12:25:20.5 HOT-2	nope no questions...we are good.		
12:25:26.0 HOT-1	so it says glider and skydiving operations...northeast...of the airport between May and September...simultaneous operations on runway eleven twenty nine right traffic runway two zero gliders use left traffic to runway twenty 'kay uhhh...wildlife in vicinity blah blah blah...hot spots...okay...and that's it...'kay? thank you.		
12:26:07.4 HOT-2	huh...I fixed it.		
12:26:11.2 HOT-1	how? you didn't know...		
12:26:14.4 HOT-2	huh?		
12:26:14.8 HOT-1	how?		
12:26:15.8 HOT-2	well I...I kept on lookin' at this...and it's like...you know what...I bet ya I can control that...it's like yeah I can control that...there we go it's fixed.		
12:26:24.0 HOT-1	hey how how did you...do that...did you go to here?		
12:26:29.2 HOT-2	well you...you put this on the one that you want to control...		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
12:26:34.0 HOT-1	ah okay.		
12:26:34.5 HOT-2	and then you hit radio.		
12:26:38.2 HOT-1	normal...below...yeah I know okay.		
12:26:41.6 HOT-2	nope...hit radio.		
12:26:46.0 HOT-1	huh? radio?		
12:26:48.6 HOT-2	R-A-D-I-O...radio.		
12:26:52.6 HOT-1	ah...***.		
12:27:00.3 HOT-2	see where it says traffic?		
12:27:01.6 HOT-1	uh huh.		
12:27:02.1 HOT-2	and the star...the diamond is on...it was off before.		
12:27:08.4 HOT-1	ah.		
12:27:14.6 HOT-1	ooooohh.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
12:28:18.3 HOT-2	FAMPU...murder [referring to the MARDR waypoint]...MARDR...KEBTE...perfect.		
12:28:49.5 HOT-2	eighteen fifty five. [referring to ATC transmission to another aircraft]		
12:28:56.0 HOT-2	we are good to go.		
12:28:59.9 CAM	[sound similar to blowing nose]		
12:29:08.2 HOT-1	have you been to South Africa?		
12:29:10.7 HOT-2	Africa no...that's the one continent that I have not been in to.		
12:29:39.9 HOT-1	*.		
12:29:45.7 HOT-2	[sound of clearing throat]		
12:29:46.3 HOT-1	what?		
12:29:47.0 HOT-2	nah I'm just looking for the traffic.		
12:29:48.6 HOT-1	ah.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
12:29:50.1 HOT-2	he's a ways out there...probably difficult to see.		
12:30:01.6 HOT-1	in which book can I see...where the...where...is all the equipment that this aircraft has...I mean...uhh...L-P-V L-D L-NAV P-B-N G-N-S blah blah blah...where can I see it?...uhh that's okay *--		
12:30:17.5 HOT-2	you need to talk to your mechanic.		
12:30:19.2 HOT-1	ah yeah?		
12:30:19.9 HOT-2	yes...and the...he will have...everything that's listed on it...uhh but he's...		
12:30:26.1 HOT-1	of course.		
12:30:26.6 HOT-2	...but he's gonna throw the switches back here and tell you what is onboard the airplane.		
12:30:31.8 HOT-1	***.		
12:30:32.7 CAM	[sound similar to seat moving]		
12:30:50.6 CAM-1	the weight and balance.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
12:31:02.4 CAM-1	(look look/could you look it up)		
12:31:05.1 HOT-2	what's that...say again? I'm up.		
12:31:09.9 HOT-1	let's see that right now.		
12:31:17.1 HOT-1	I wanna go...wait a minute...I have all this...so...how can I...fill all these things? (complicate).		
12:31:37.5 HOT-2	you need to set them all.		
12:31:38.6 HOT-1	haha how...haha.		
12:31:40.7 HOT-2	right there.		
12:31:41.3 HOT-1	you (don't) know?		
12:31:48.4 HOT-2	no you're gonna have...		
12:32:08.9 HOT-2	so there's balance arms for the cockpit.		
12:32:19.0 CAM	[sounds of thumping]		
12:32:29.7 HOT-2	mmmhhh. [sound of straining]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
12:32:35.6 HOT-1	[sounds similar to struggling with headset]		
12:32:50.8 HOT-2	there's your arms for those two seats.		
12:32:57.7 HOT-2	there's your arms for the...tanks.		
12:33:03.1 HOT-1	[sounds similar to struggling with headset]		
12:33:13.0 HOT-1	okay.		
12:33:13.3 HOT-2	so all of...all of the numbers are in there and you just build it.		
12:33:34.4 CAM	[sound of latch]		
12:33:36.0 HOT-2	[sound of exhale]		
12:33:41.2 HOT-2	but I bet you...if you call ForeFlight I bet you somebody has it already *.		
12:33:48.4 HOT-2	might be a good exercise just to plug it all in.		
12:33:53.3 HOT-1	so (cockpit) arm not set...station *...*.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
12:34:05.7 HOT-2	what.		
12:34:08.0 HOT-1	*** station ***.		
12:34:10.3 HOT-2	there's the arm...there's the inches...two fifty five.		
12:34:15.6 HOT-1	so in the arm here?		
12:34:16.9 HOT-2	two fifty five.		
12:34:19.4 HOT-2	does it say inches? is there a limit? none.		
12:34:25.5 HOT-2	right?		
12:34:26.2 HOT-1	***?		
12:34:27.6 HOT-2	yep.		
12:34:28.0 HOT-1	that's it?		
12:34:28.7 HOT-2	next.		
12:34:35.6 HOT-1	* twelve seats?		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
12:34:37.3 HOT-2	you gotta go find it.		
12:34:44.5 HOT-1	***.		
12:34:45.3 HOT-2	keep going...that's all engine...fuels.		
		12:35:05.0 ZLC-A	november five romeo tango contact Salt Lake center one three two point two five.
		12:35:15.3 ZLC-A	november six zero five tango romeo contact Salt Lake center one three two point two five.
		12:35:19.5 RDO-2	thirty two twenty five have a nice day five tango ro-.
		12:35:27.7 RDO-2	center november six zero five tango romeo tree seven zero smooth.
		12:35:31.4 ZLC-B	november six zero five tango romeo Salt Lake center.
12:36:27.3 HOT-1	***hmm...guess gonna pick.		
12:37:16.6 HOT-1	ah...this one right?		
		12:38:03.0 ZLC-B	november five tango romeo cleared direct Truckee airport.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		12:38:06.3 RDO-2	direct to the airport five tango romeo.
12:38:10.3 HOT-2	which one do you want to go to?		
12:38:12.6 HOT-1	uhh let's to go ehh...we should go to...		
12:38:20.9 HOT-2	we should go to where?		
12:38:24.2 HOT-1	let's to go...MUSTANG...no?		
12:38:40.6 HOT-2	we were just cleared to the airport.		
12:38:48.9 HOT-2	***.		
12:38:59.2 HOT-1	*** (works works fine/I don't know where to find it).		
12:39:10.8 HOT-1	okay...what's that meaning of LEMAC?		
12:39:19.0 HOT-2	*?		
12:39:19.8 HOT-1	LEMAC?		
12:39:22.1 HOT-2	leading edge mean aer-aerodynamic chord...so where is the front of the wing.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
12:39:32.2 HOT-1	where is what?		
12:39:34.0 HOT-2	where is the front edge of the wing.		
12:39:38.2 HOT-1	uhh...that would be here right?		
12:40:05.9 HOT-1	LEMAC...this one right?		
12:41:47.3 HOT-1	#.		
12:41:49.5 HOT-2	(what?/right?)		
12:41:50.3 HOT-1	I have (aircraft) work to do with you.		
12:43:01.6 HOT-2	what is our wingspan?		
12:43:04.2 HOT-1	it's uhh...sixty four.		
12:43:14.1 HOT-1	that is the maximum...*.		
12:43:16.4 HOT-2	the maximum.		
12:45:01.3 CAM	[sound of latch]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
12:45:55.7 HOT-1	so we cannot enter from here?		
12:45:58.4 HOT-2	no.		
12:45:59.6 HOT-2	the radial is coming from this direction.		
12:46:04.8 HOT-1	you mean you cannot enter like that and that?		
12:46:07.5 HOT-2	correct.		
12:46:09.2 HOT-1	why why don't they put those kind of notes?		
12:46:12.6 HOT-2	they're right there.		
12:46:15.9 HOT-1	** it's coordination or for...		
12:46:18.5 HOT-2	it's for the mountains.		
12:46:20.8 HOT-2	so the other side there's...there's nothing out here.		
12:46:26.4 HOT-1	okay.		
12:46:42.3 HOT-1	[sound of exhale]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
12:46:47.6 HOT-1	[sound of blowing nose]		
		12:48:14.3 AWOS	airport automated weather observation one niner five one zulu weather wind zero eight zero at five visibility seven clear below one two thousand temperature three two Celsius dewpoint five altimeter three zero one four remarks density altitude eight thousand niner hundred...Truckee traffic be advised actual visibility may be different than what is shown on A-WOS due to heavy smoke...Truckee Tahoe airport automated weather observation one--.
		12:48:16.2 ZLC-B	november five tango romeo descend and maintain flight level three four zero.
		12:48:19.8 RDO-2	three four zero five tango romeo.
12:48:24.0 HOT-2	three four zero set.		
12:48:25.0 HOT-1	thank you--checklist when you can.		
12:48:28.2 HOT-2	are you going to be on the headphones or are you just going to whisper...		
12:48:30.5 HOT-1	(well/what).		
12:48:31.4 HOT-2	okay it's...one or the other...(but/'cause) I can't hear you whispering...		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
12:48:34.6 HOT-1	yeah.		
12:48:35.2 HOT-2	and I'm hearing the...I'm turning my speaker off...I'm off one.		
12:48:39.0 HOT-1	descent checklist please.		
		12:48:44.2 ZLC-B	november five tango romeo contact Oakland Center uh one three four point four five.
12:48:45.0 HOT-2	descent check you have the A-TIS yet?		
		12:48:49.3 RDO-2	thirty four forty five nice day see ya.
		12:49:03.9 RDO-2	center november six zero five tango romeo tree six seven descending tree four zero.
		12:49:10.0 ZOA-C	november six zero five tango romeo Oakland center good afternoon.
12:49:13.0 HOT-2	'kay...A-TIS you got it?		
12:49:14.6 HOT-1	nope...you got it?		
12:49:18.8 HOT-2	nah I was telling you I'm picking it up right now...		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
12:49:20.6 HOT-1	ah.		
12:49:21.0 HOT-2	...and you called for a checklist and then you...so...		
12:49:23.5 HOT-1	ha ha ha ha.		
12:49:24.2 HOT-2	...I'm gonna get the A-TIS.		
12:49:25.2 HOT-1	okay...thank you.		
12:49:27.5 HOT-2	you're welcome.		
12:49:30.3 HOT-2	I'm off.		
12:49:31.2 HOT-1	okay.		
		12:49:31.9 AWOS	...twenty one hundred to zero seven hundred local...Truckee...Truckee Tahoe airport automated weather observation one niner five one zulu weather wind zero eight zero at five visibility seven clear below one two thousand temperature three two Celsius dewpoint five altimeter three zero one four remarks density altitude eight thousand niner hundred...Truckee traffic be advised actual visibility may be different than what is shown on A-WOS due to heavy smoke in the area...conditions are not monitored from twenty one hundred to zero seven hundred local...Truckee.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
12:50:20.3 HOT-2	all right current weather conditions...wind zero eight zero at five knots...seven miles clear skies thirty two degrees...fourteen on the meters.		
12:50:32.4 HOT-1	zero eight zero at five...what else?		
12:50:34.2 HOT-2	correct.		
12:50:36.2 HOT-1	* the altimeter?		
12:50:39.9 HOT-2	three zero one four.		
12:50:45.5 HOT-2	temperature...thirty two.		
12:50:50.3 CAM	[sound similar to altitude alert]		
12:50:51.2 HOT-1	okay.		
12:50:54.0 HOT-2	it's V-F-R seven miles...okay.		
12:50:56.2 HOT-1	check.		
12:50:58.9 HOT-2	A-TIS is copy. CAS check and clear. TAWS terrain is on--not required. Landing data...have you sent?		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
12:51:07.8 HOT-1	yes.		
12:51:10.3 HOT-2	I'm gonna update that for you.		
12:51:22.6 HOT-2	new numbers are sent...eighteen twenty-nine forty-five.		
12:51:28.1 HOT-2	approach brief.		
12:51:31.1 HOT-1	so umm...depending on the visibility...I guess I'm gonna...I'm gonna shoot anyway the...the R-NAV...or the G-P-S...if they...if they can allow me to fly the visual to * if not...we do everything.		
12:51:49.5 HOT-2	okay.		
12:51:50.1 HOT-1	I mean we...we can request say can we fly to ALANT and if not...I mean if we don't see--just shoot the approach.		
12:51:56.6 HOT-2	'kay.		
		12:51:57.3 ZOA-C	* six zero five tango romeo descend and maintain flight level three two zero.
		12:52:00.7 RDO-2	three two zero five tango romeo.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
12:52:02.8 HOT-2	thirty two.		
12:52:03.6 HOT-1	check.		
12:52:05.2 HOT-2	approach brief is complete...approach checks...eh let's see...shoulder harness is set. pressurization is set. check wing cowling ice is off not required. windshield heat is still in the low position. fuel quantity and balance it's uhh...sufficient and within limits. standing by on transition altitude. descent checks are complete.		
12:52:20.4 HOT-1	thank you.		
12:52:20.7 HOT-2	who is...who are we talking to for the approach?		
12:52:35.0 HOT-2	it would be Oakland center twenty seven ninety five.		
12:52:40.6 HOT-2	and twenty fifty seven.		
12:52:47.5 HOT-2	perfect...woohoo.		
12:53:14.7 CAM	[sound similar to altitude alert]		
12:53:17.2 HOT-2	one to go.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
12:53:17.7 HOT-1	check.		
		12:53:31.1 ZOA-C	* five tango romeo descend and maintain flight level three zero zero.
		12:53:34.2 RDO-2	three zero zero five tango romeo.
12:53:36.3 HOT-2	three zero zero is set.		
12:53:38.3 HOT-1	check.		
12:53:46.7 HOT-2	so on ALANT...there is a procedure turn.		
12:54:11.2 HOT-2	just want to make sure though you're aware...you have to do the procedure turn.		
12:54:17.2 HOT-1	well actually it says here...no procedure turn.		
12:54:20.4 HOT-2	perfect...I'm seeing it now.		
12:54:22.7 HOT-1	okay.		
12:54:23.1 HOT-2	no procedure turn...perfect...thank you.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
12:54:31.0 HOT-2	you have Jepps don't you?		
12:54:32.7 HOT-1	yes.		
12:54:33.0 HOT-2	you've got the Jepps account okay.		
12:54:36.8 HOT-2	I do not.		
12:54:40.1 HOT-2	that is very nice.		
12:54:41.5 HOT-1	what?		
12:54:42.5 HOT-2	having Jepps - I do not.		
12:54:44.1 HOT-1	yeah.		
12:54:46.6 HOT-1	because you don't want it.		
12:54:47.9 HOT-2	no because I'm not gonna pay for it.		
12:54:48.6 CAM	[sound similar to altitude alert]		
12:54:49.8 HOT-2	they're very expensive.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
12:54:53.6 HOT-2	one to go...thirty one descending thirty.		
		12:55:22.9 RDO-2	Oakland six zero fir- tango romeo.
		12:55:27.9 ZOA-C	zero five tango romeo say again?
		12:55:29.6 RDO-2	any possibility direct ALANT for the G-P-S runway one one?
		12:55:38.3 ZOA-C	november five tango romeo how do you spell it?
		12:55:40.6 RDO-2	alpha lima alpha november tango.
		12:55:44.4 RDO-2	it's right five.
		12:55:49.8 ZOA-C	november five tango romeo cleared as requested.
		12:55:52.6 RDO-2	cleared as requested five tango romeo thank you sir.
12:55:55.1 HOT-2	there you go brother.		
12:55:56.1 HOT-1	thank you.		
12:55:56.5 HOT-2	how you like them apples?		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		12:55:57.4 ZOA-C	november five tango romeo contact Oakland center one two eight point eight.
		12:56:00.5 RDO-2	twenty eight eight nice day see ya!
		12:56:02.2 ZOA-C	see ya!
12:56:04.5 HOT-?	[sound of chuckle]		
		12:56:06.6 RDO-2	Oakland gooooooood afternoon november six zero five tango romeo tree zero zero direct ALANT.
		12:56:13.3 ZOA-D	november six zero five tango romeo Oakland center roger descend and maintain flight level two zero zero.
		12:56:18.8 RDO-2	zero zero five tango romeo.
12:56:20.6 HOT-2	two zero zero is set sir.		
12:56:22.2 HOT-1	thank you.		
12:56:22.8 HOT-2	and there is direct to the altitude.		
12:56:27.6 HOT-2	V-NAV is available...path is captured...hang on everybody here we goooooooooo.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
12:56:32.0 HOT-2	[sound of mouth popping]		
12:56:37.1 HOT-2	very comfortable very nice.		
12:56:50.3 HOT-2	wow...this thing is so tight.		
12:57:18.4 HOT-2	how you feeling over there?		
12:57:20.9 HOT-1	cool.		
12:57:21.9 HOT-2	you. [exclamation] how you feeling?		
12:57:22.9 HOT-1	yeah cool. [exclamation]		
12:57:23.8 HOT-2	perfect.		
12:58:00.3 HOT-2	[sound of breathing]		
		12:58:23.2 ZOA-D	november six zero five tango romeo you can expect the R-NAV two zero to Truckee cleared present position direct AWEGA alpha whiskey echo golf alpha direct Truckee.
		12:58:33.8 RDO-2	roger that uhh...we're expecting the G-P-S runway two zero and I'm looking up the spelling real quick didn't get a chance to copy it hang on.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
12:58:42.4 HOT-1	the runway's too short.		
12:58:43.5 HOT-2	alpha...		
12:58:45.6 HOT-1	for runway twenty...so we will have to circle to land...so we can't...cannot accept that.		
12:58:52.5 HOT-2	it's too short?		
12:58:53.7 HOT-1	four thousand six hundred...minimum is five thousand.		
12:58:57.2 HOT-2	for who?		
12:58:58.6 HOT-1	huh?		
12:58:59.2 HOT-2	for whom?		
12:59:00.3 HOT-1	for me...well...and for the book.		
12:59:06.4 HOT-2	AWEGA's in there...just...just fly this for now...		
12:59:09.4 HOT-1	okay.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
12:59:10.1 HOT-2	and I'm gonna do the performance...for departure approach arrival...runway two zero...legs...performance...approach...tailwind...forty-forty six hundred feet...next...you got twenty eight point five...		
12:59:47.2 HOT-2	it's forty six fifty five...forty six hundred.		
12:59:53.5 HOT-1	too tight.		
12:59:54.2 HOT-2	yeah.		
12:59:57.0 HOT-1	we can make it and we can circle to land.		
		13:00:01.6 RDO-2	and Oakland six zero five tango romeo.
13:00:03.8 HOT-1	to the left.		
		13:00:10.5 ZOA-D	november six zero five tango romeo go ahead.
		13:00:12.4 RDO-2	runway's too short for us we're gonna need to...we can take that approach and circle for runway one one but we're not gonna be able to land two zero...we need the longer runway.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		13:00:26.6 ZOA-D	november six zero five tango romeo uh roger...you can uh...plan on uh circling approach...we'll coordinate with Truckee.
		13:00:34.5 RDO-2	appreciate it...six zero five tango romeo thank you sir.
13:00:34.8 HOT-1	*.		
13:00:35.6 CAM	[sound similar to altitude alert]		
13:00:44.2 HOT-2	AWEGA...WEGA...		
13:00:46.4 HOT-2	...is cued...		
13:00:54.7 HOT-2	...and...arrival will be the visual runway one one...execute legs...badum bum...procedure...ta ta ta...		
13:01:09.6 HOT-1	* we are twelve thousand feet?...we are too high.		
13:01:18.4 HOT-2	did he tell us two thousand...twelve thousand?		
13:01:20.4 HOT-1	tw-two zero zero no.		
13:01:22.7 HOT-2	he told us two zero zero.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
13:01:23.9 HOT-1	yes.		
13:01:24.3 HOT-2	yeah okay so he's got a plan yes?		
13:01:25.7 HOT-1	okay.		
		13:01:26.9 RDO-2	and six zero five tango romeo will take lower when able.
		13:01:36.2 ZOA-D	november six zero five tango romeo you can expect lower in a minute uhh...you'll be number two goin' into Truckee so you can expect some delays.
		13:01:41.6 RDO-2	perfect thank you sir appreciate the heads up.
13:01:44.1 HOT-2	all right so I'm gonna bring back the other approach...		
13:01:48.8 HOT-2	...G-P-S runway two zero...execute...		
13:01:52.7 HOT-2	...legs...AWEGA...up.		
13:01:58.9 HOT-2	legs...AWEGA...		
13:02:07.3 HOT-2	execute.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
13:02:46.1 HOT-1	can you ask him if he wants us to enter the hold?		
		13:02:54.0 RDO-2	and do you want six zero five tango romeo to enter the hold at AWEGA?
		13:02:59.0 ZOA-D	november six zero five tango romeo contact Oakland center one two seven point niner five they'll have further instructions for ya.
		13:03:03.6 RDO-2	twenty seven ninety five see ya.
		13:03:22.6 RDO-2	center november six zero five tango romeo is with you two zero zero.
		13:03:30.3 ZOA-E	november six zero five tango romeo Oakland center...roger...advise if you have the weather for Truckee expect the R-NAV runway two zero and expect holding you're number three.
		13:03:40.7 RDO-2	roger that do you want us holding at AWEGA?
		13:03:48.6 ZOA-E	november five tango romeo you can expect...expect holding at uh ALVVA.
		13:03:53.5 RDO-2	roger that six oh...five...tango...romeo.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
13:03:58.8 HOT-2	what is that name she said? ELBA?		
13:03:59.8 HOT-1	I dunno where is ELBA...ah ALVVA.		
13:04:07.0 HOT-2	is it on the chart?		
13:04:08.6 HOT-1	yeah it's here...but it's...		
13:04:19.4 HOT-2	it's where?		
13:04:20.5 HOT-1	ALVVA? I guess (she said).		
13:04:24.7 HOT-2	yeah I'm gonna...I'm gonna wait until she tells us otherwise...I mean...		
13:04:27.3 HOT-1	yes.		
		13:04:49.8 RDO-2	need a clearance for six zero five tango romeo.
		13:04:52.5 ZOA-E	november six zero five tango romeo cleared to the ALVVA intersection...uh hold north on the three four zero bearing...uh...turns and uh leg length at your discretion...expect further clearance two zero three zero time now two zero zero five and a quarter.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		13:05:10.1 RDO-2	ALVVA hold north three four zero bearing two zero three zero for the further clearance leg length our choices for...five tango romeo.
13:05:18.9 HOT-2	so.		
13:05:19.9 HOT-1	I just put ALVVA?		
13:05:21.7 HOT-2	hit...direct ALVVA...get that one done right off the bat.		
13:05:25.1 HOT-1	now uh...wh-where do you go to hold? is it in uh...index?		
13:05:36.0 HOT-2	my friend...select direct ALVVA please.		
13:05:45.0 HOT-1	it's...it's ALVVA.		
13:05:48.6 HOT-1	alpha lima victor victor alpha.		
13:05:54.7 HOT-2	I'm gonna start the turn for ya 'cause we're missing it.		
13:05:57.9 HOT-1	thank you.		
13:06:00.0 HOT-1	(I don't know what it is).		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
13:06:00.9 HOT-2	I've got you in a right hand turn to ALVVA.		
13:06:03.5 HOT-1	yes.		
13:06:09.3 HOT-1	direct.		
13:06:12.0 HOT-1	next.		
13:06:14.9 HOT-1	direct.		
13:06:23.6 HOT-2	I'm gonna touch your stuff.		
13:06:33.4 HOT-2	da da da da da da...index...hold.		
13:06:37.7 HOT-1	hold.		
13:06:38.3 HOT-2	new hold...now then we're gonna type it there.		
13:06:41.5 HOT-1	* huh?		
13:06:45.3 HOT-2	three four zero right hand turns...ten mile legs...da da da da...execute that little #.		
13:07:03.7 HOT-2	does that work for you?		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
13:07:05.2 HOT-1	yes.		
13:07:05.9 HOT-2	okay...now you can build the rest of the approach...and the...twenty thirty is the...uh...time...where's the E-F-C time two zero...		
13:07:24.3 HOT-2	perfect okay...so the airplane's doing this.		
13:07:33.6 HOT-2	now...we're doing that.		
13:07:37.4 HOT-2	now we're gonna do the...		
13:08:03.5 HOT-2	perfect.		
13:08:06.2 HOT-2	all right everything...		
13:08:12.8 HOT-1	direct...		
13:08:13.6 HOT-2	G-P-S.		
13:08:13.9 HOT-1	direct hold at this one right?		
13:08:16.2 HOT-2	I'm sorry?		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
13:08:16.8 HOT-1	direct this one right?		
13:08:17.9 HOT-2	we're...it's already holding so...		
13:08:20.1 HOT-1	so I just put NAV.		
13:08:21.0 HOT-2	yep absolutely.		
13:09:06.8 HOT-1	so we're gonna hold here and then...		
13:09:07.9 HOT-2	uh huh...		
13:09:18.7 HOT-2	ZILTO...I'm not seeing that one.		
		13:09:38.2 ZOA-E	november five tango romeo descend and maintain one four thousand expect the approach shortly.
		13:09:43.6 RDO-2	one four thousand six zero five tango romeo.
13:09:46.8 HOT-2	one four thousand set.		
13:09:49.3 HOT-1	(right).		
13:09:58.2 HOT-2	#...I am not seeing it.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
13:10:41.2 HOT-2	twenty fifty seven.		
13:10:47.9 HOT-2	whatcha doing my friend?		
13:10:52.2 HOT-1	I'm just trying to...		
13:10:53.8 HOT-2	see if the numbers will work?		
13:10:55.2 HOT-1	nah...to put the...runway...		
13:11:00.5 HOT-2	there you go.		
13:11:09.7 HOT-2	twenty seven six.		
		13:11:23.3 RDO-2	six zero five tango romeo is established in the hold.
		13:11:26.5 ZOA-E	november...five tango romeo...uh...I'll have the approach here for you in a minute.
		13:11:33.8 RDO-2	roger that.
13:11:36.3 HOT-1	so...three zero zero seven at Truckee...three zero zero seven.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		13:11:43.0 ZOA-E	november five tango romeo cleared direct AWEGA cross AWEGA at or above one two thousand cleared R-NAV runway two zero approach Truckee airport.
13:11:50.3 HOT-2	are you ready for it?		
13:11:51.1 HOT-1	yes.		
		13:11:52.5 RDO-2	'kay direct AWEGA and...uh cleared for the approach five tango romeo.
13:12:01.3 HOT-2	there...NAV is available...approach is available.		
13:12:05.5 HOT-1	thank you.		
13:12:13.3 HOT-2	are you gonna be able to get down? yes...twelve thousand...		
13:12:23.1 HOT-2	twelve thousand is set.		
13:12:39.1 HOT-2	we've got a ways to go.		
13:12:41.5 HOT-1	next one fifty...		
13:12:42.6 HOT-2	you got plenty of time.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
13:12:43.0 HOT-1	...(* thousand) five hundred.		
13:12:45.5 HOT-2	plenty of time.		
13:12:47.5 HOT-2	what's our met-what's our meter?		
13:12:48.6 HOT-1	nine thousand five hun...uhhh three zero zero seven.		
13:12:51.7 HOT-1	and.		
13:12:53.8 HOT-1	we are cleared for the approach right?		
13:12:55.2 HOT-2	yes. cleared for the approach.		
13:12:57.5 HOT-1	thank you.		
13:12:59.1 HOT-2	nine thousand five hundred is set.		
13:13:10.3 CAM	traffic traffic. [electronic voice]		
13:13:13.1 HOT-2	he's climbing out...three thousand feet below us.		
13:13:24.5 HOT-2	gotta get this thing slowed down.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
13:13:31.8 HOT-2	you wanna right three sixty?		
13:13:33.9 HOT-1	no I can do it.		
13:13:36.5 HOT-2	I don't see you on here.		
13:13:41.0 HOT-1	now just...uh...below two fifty give me flaps twenty please.		
13:13:45.9 HOT-2	below two fifty? how 'bout below two thirty?		
13:13:49.1 HOT-1	two thirty...two...sorry.		
13:13:50.8 CAM	[sound similar to altitude alert]		
13:13:53.4 HOT-2	slope is available.		
13:13:57.4 HOT-2	start slowin' the puppy up.		
		13:14:06.7 ZOA-F	november five tango romeo I'm not sure if you're still here radar service terminated contact Truckee tower one two zero point five seven.
		13:14:12.6 RDO-2	two zero five seven nice day see ya.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
13:14:15.0 HOT-1	thank you...flaps twenty.		
13:14:17.4 CAM	[sound similar to VNAV track alert]		
13:14:17.9 HOT-2	twenty is selected.		
13:14:20.3 HOT-1	before land uh...uhh...		
13:14:21.6 HOT-2	alt cap...perfect.		
13:14:22.2 HOT-1	in range and before landing.		
13:14:23.6 HOT-2	did you select approach? please select approach.		
13:14:26.4 HOT-1	'kay...		
13:14:26.7 HOT-2	thank you.		
13:14:28.5 HOT-1	***.		
13:14:30.8 HOT-2	path is captured.		
13:14:32.4 HOT-2	standing by on gear and flaps.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
13:14:34.2 HOT-1	'kay.		
		13:14:34.5 RDO-2	tower november six zero five tango romeo is with you LUMMO inbound and we are going to have to circle the runway one one for runway length.
		13:14:42.6 TWR	Challenger six zero five tango romeo Truckee tower uh...roger report the airport in sight when you're breaking off the approach you can either enter the downwind for one one or you can enter...you can enter a uh left downwind for one one or you can go over the top left downwind for two nine.
		13:14:54.7 RDO-2	'preciate it very much looking forward to seeing you guys.
13:14:57.3 HOT-1	gear down.		
		13:14:57.5 TWR	roger.
13:14:58.1 HOT-2	oh # you came off...what are you...ah never mind.		
13:15:03.6 HOT-2	how 'bout gear down flaps thirty before landing checklist.		
13:15:04.7 HOT-1	(gear down) please.		
13:15:05.5 CAM	[increase in ambient noise consistent with gear down]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
13:15:06.0 HOT-1	please please.		
13:15:09.8 HOT-2	# what happened?		
13:15:13.4 CAM	[sound consistent with altitude alert]		
13:15:17.4 HOT-2	I've got intermittent ground contact.		
13:15:20.1 HOT-1	flaps...thirty please?		
13:15:22.6 HOT-2	no...we're at flaps thirty...gear down.		
13:15:25.2 HOT-1	flaps thirty.		
13:15:25.6 HOT-2	before landing checklist co...		
13:15:26.8 HOT-1	thank you.		
13:15:28.7 HOT-2	anti-skid thrust reversers are armed...		
13:15:38.1 HOT-1	so it's to the left right?		
13:15:40.3 HOT-1	to the left.		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
13:15:40.8 HOT-2	we're gonna have to make a right hand turn to get to it.		
13:15:42.3 HOT-1	yes.		
13:15:44.1 CAM	twenty five hundred. [electronic voice]		
13:15:46.0 CAM	[sound similar to seat moving]		
13:15:55.2 HOT-2	five miles away.		
13:15:57.9 HOT-2	I see the runway...I mean I see the...I see the...freeway.		
13:16:09.0 HOT-2	is that the airport right th...I dunno we're gonna wait and see.		
13:16:12.1 HOT-1	uh...circle to land is seven...seven seven hundred.		
13:16:15.0 HOT-2	what's that?		
13:16:15.9 HOT-1	do you see the airport?		
13:16:16.4 CAM	approaching minimums. [electronic voice]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
13:16:16.9 HOT-2	no not yet.		
13:16:17.9 HOT-2	final flaps ready for it?		
13:16:19.4 HOT-1	full flaps.		
13:16:19.8 CAM	[sound of lever moving]		
13:16:20.4 CAM	minimums. [electronic voice]		
13:16:20.7 HOT-2	there's the airport.		
13:16:21.6 HOT-1	where?		
13:16:22.8 HOT-2	right there.		
13:16:23.8 HOT-2	make a right hand turn ninety degrees.		
		13:16:26.3 RDO-2	six zero five tango romeo is making the right hand turn we've got runway one one in sight.
		13:16:30.4 TWR	november five tango romeo roger runway one one cleared to land wind calm *.

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
		13:16:34.9 RDO-2	cleared to land six zero five tango romeo.
13:16:36.9 HOT-1	where?		
13:16:37.5 HOT-2	you see that hangars?		
13:16:40.5 HOT-1	yes.		
13:16:40.9 HOT-2	you're at...you're going at them right...right there.		
13:16:43.4 HOT-2	roll out.		
13:16:47.2 HOT-2	turn the autopilot off.		
13:16:49.3 CAM	[sound similar to cavalry charge]		
13:16:52.6 CAM	[sound of lever moving]		
13:16:53.5 HOT-2	I'm gonna get your speed under control for you.		
13:16:56.2 HOT-1	oh I see the runway.		
13:16:57.6 HOT-2	you can...		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
13:16:57.8 HOT-1	it's this one right?		
13:16:58.4 HOT-2	yep you can start descending.		
13:17:00.1 HOT-1	'kay full flaps.		
13:17:02.2 HOT-2	you do have full flaps.		
13:17:04.5 HOT-2	patience patience patience you got all the time in the world.		
13:17:09.8 HOT-2	okay?		
13:17:10.4 HOT-1	yes.		
13:17:12.6 HOT-2	we don't wanna be on the news.		
13:17:14.8 HOT-2	autothrottles have it.		
13:17:17.8 HOT-2	you are looking very good my friend.		
13:17:24.1 HOT-2	nice and relaxed...bring that turn around.		
13:17:24.3 CAM	[sound similar to increase in engine rpm]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
13:17:27.5 HOT-2	perfect.		
13:17:30.2 HOT-2	it's okay...you got plenty of time.		
13:17:33.6 HOT-2	let it keep comin' down though.		
13:17:41.4 CAM	one thousand. [electronic voice]		
13:17:42.7 HOT-2	did you? oh you turned the throttles off...		
13:17:43.5 CAM	[sound similar to altitude alert]		
13:17:44.4 HOT-1	yes.		
13:17:44.6 HOT-2	(shoot/#).		
13:17:46.4 HOT-2	let me see the airplane for a second.		
13:17:51.6 CAM	[sound similar to decreasing engine rpm]		
13:17:54.7 HOT-2	we're gonna go through it and come back okay?		
13:17:56.8 HOT-1	okayyy...		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
13:18:00.4 HOT-1	it's here. [exclamation]		
13:18:01.4 HOT-2	yes yes it's here but we are very high.		
13:18:03.6 CAM	sink rate. [electronic voice]		
13:18:04.2 CAM	[sounds similar to stick shaker activation]		
13:18:04.2 HOT-1	what are you doing?		
13:18:04.2 CAM	pull up. [electronic voice]		
13:18:04.5 HOT-2	'kay.		
13:18:04.8 HOT-1	*.		
13:18:04.9 CAM	[warbler sound consistent with stall warning]		
13:18:05.0 HOT-2	no no no.		
13:18:06.2 HOT-2	let-		
13:18:06.5 HOT-1	what are you doing?		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
13:18:06.6 CAM	pull up. [electronic voice]		
13:18:06.6 HOT-2	let me have the airplane.		
13:18:07.3 HOT-2	let me have the airplane.		
13:18:07.9 CAM	[sounds similar to stick shaker activation]		
13:18:07.9 CAM	[warbler sound consistent with stall warning, continues throughout the end of the recording]		
13:18:08.0 CAM	pull up. [electronic voice]		
13:18:08.6 HOT-2	let me have the airplane.		
13:18:09.4 CAM	pull up. [electronic voice]		
13:18:09.7 HOT-1	oh. [exclamation]		
13:18:10.0 HOT-2	oh #.		
13:18:10.8 HOT-?	#. [exclamation]		
13:18:11.0 CAM	pull-- [electronic voice]		

Time and Source	Intra-Aircraft Communication	Time and Source	Over-the-Air Communication
13:18:11.3 CAM	[sounds consistent with impact]		
13:18:12.2 END OF TRANSCRIPT END OF RECORDING			